



National Highway Traffic Safety Administration

[Docket No. NHTSA-2019-0082]

Agency Information Collection Activities; Submission to the Office of Management and Budget for Review and Approval: Drivers' Use of Camera-Based Rear Visibility Systems Versus Traditional Mirrors

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

ACTION: Notice and request for comments on a request for approval of a new information collection.

SUMMARY: In compliance with the Paperwork Reduction Act of 1995 (PRA), this notice announces the Information Collection Request (ICR) abstracted below has been forwarded to the Office of Management and Budget (OMB) for review and approval. The ICR describes the nature of the information collection and its expected burden. The proposed new collection of information supports research addressing safety-related aspects of drivers' use of camera-based rear visibility systems intended to serve as a replacement for traditional outside rearview mirrors. A Federal Register Notice with a 60-day comment period soliciting comments on the following information collection was published on August 28, 2019. NHTSA received 22 public comments submitted online and one additional comment submitted via e-mail. A second Federal Register Notice with a 60-day comment period soliciting comments on the following information collection was published on May 24, 2021. NHTSA received 1,891 unique public comments. A summary of the comments and the changes NHTSA made in response to those comments is provided below.

DATES: Written comments should be submitted on or before **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Written comments and recommendations for the proposed information

collection, including suggestions for reducing burden, should be submitted to the Office of Management and Budget at www.reginfo.gov/public/do/PRAMain. To find this particular information collection, select “Currently under 30-day Review – Open for Public Comment” or use the search function.

FOR FURTHER INFORMATION CONTACT: For additional information or access to background documents, contact Elizabeth Mazzae, Applied Crash Avoidance Research Division, Vehicle Research and Test Center, NHTSA, 10820 State Route 347—Bldg. 60, East Liberty, Ohio 43319; Telephone (937) 666-4511; Facsimile: (937) 666-3590; e-mail address: elizabeth.mazzae@dot.gov.

SUPPLEMENTARY INFORMATION: Under the PRA (44 U.S.C. 3501 *et seq.*), a Federal agency must receive approval from the Office of Management and Budget (OMB) before it collects certain information from the public and a person is not required to respond to a collection of information by a Federal agency unless the collection displays a valid OMB control number. In compliance with these requirements, this notice announces the following information collection request will be submitted to OMB.

Title: Drivers’ Use of Camera-Based Rear Visibility Systems Versus Traditional Mirrors

OMB Control Number: To be issued at time of approval.

Form Numbers: NHTSA forms 1553, 1554, 1556, 1557, 1558

Type of Request: New information collection

Type of Review Requested: Regular

Length of Approval Requested: Three years from the date of approval

Summary of the Collection of Information: NHTSA has proposed to perform research involving the collection of information from the public as part of a multi-year effort to learn about drivers’ use of passive camera-based rear visibility systems intended to perform the same function as traditional vehicle outside mirrors: displaying areas surrounding the vehicle.

Performing detection of objects within the system's field of view and providing visual or other alerts to the driver is not a technology function being examined in this research.

The research will involve human subjects testing in which instrumented vehicles are stationary or driven on a test track and public roads. Study participants will be members of the general public and participation will be voluntary. The goal is to characterize drivers' eye glance behavior and other driving behaviors while operating a vehicle equipped with traditional outside mirrors versus while operating a vehicle equipped with a camera-based visibility system in place of vehicle outside mirrors. This research will support NHTSA decisions relating to safe implementation of electronic visibility technologies that may be considered for use as alternatives to meet Federal Motor Vehicle Safety Standard (FMVSS) No. 111 mirror requirements.

This research will involve information collection through participant screening questions and post-drive questionnaires. Questions addressed to individuals will serve to assess individuals' suitability for study participation, to obtain feedback regarding participants' use of the visibility systems involved in the study, and to evaluate individuals' level of comfort with use of the technology.

Since qualitative feedback or self-reported data is not sufficiently robust for the purpose of investigating driver performance and interaction issues with advanced vehicle technologies, the primary type of information to be collected in this research is objective data consisting of video and engineering data recorded as participants experience a camera-based rear visibility system in an instrumented study vehicle. Recorded objective data will include driver eye glance behavior, lane change performance, and other driving performance metrics. Eye glance behavior will reveal how drivers' visual behavior in a vehicle equipped with a camera-based rear visibility system differs from drivers' visual behavior in a vehicle equipped with traditional outside mirrors. Lane change performance will be characterized based on vehicle speed, inter-vehicle distances during lane changes, and time to complete lane changes. Driving performance and eye

glance behavior in a vehicle equipped with a camera-based rear visibility system will be compared to lane change performance observed in a vehicle equipped with traditional outside mirrors.

Description of the Need for the Information and Proposed Use of the Information: The National Highway Traffic Safety Administration's mission is to save lives, prevent injuries, and reduce economic costs associated with motor vehicle crashes. As new vehicle technologies are developed, it is prudent to ensure they do not create any unintended decrease in safety. The safety of passive visibility-related technologies depends on both the performance of the systems and on drivers' ability to effectively and comfortably use the systems. This work seeks to examine and compare drivers' eye glance behavior and aspects of driving behavior and lane change maneuver execution for traditional mirrors and camera-based systems intended to replace outside rearview mirrors.

The collection of information will consist of: (1) Question Set 1, Driving Research Study Interest Response Form, (2) Question Set 2, Candidate Screening, (3) passive observation of driving behavior, (4) Question Set 3, Post-Drive Questionnaire: Drive with Camera-Monitoring System, (5) Question Set 4, Post-Drive Questionnaire: Drive with Traditional Mirrors, (6) Question Set 5, Post-Drive Questionnaire Final Opinions.

Affected Public (Respondents): Research participants will be licensed drivers aged 25 to 65 years of age who drive at least an average number of 11,000 miles annually, are in good health, and do not require assistive devices to safely operate a vehicle and drive continuously for a period of 3 hours.

Frequency of Collection: The data collections described will be performed once to obtain the target number of 128 valid test participants. Assuming typical data loss rates for instrumented vehicle testing with human subjects, it is anticipated that 200 participants will need to be run in order to obtain 128 valid participant datasets.

Estimated Number of Respondents: The data collection will have two parts: one involving light vehicles that will begin immediately upon receipt of PRA clearance and a second, subsequent part will involve heavy trucks. The second part of the data collection will have the same general approach involving assessment of eye glance behavior and lane change performance as a function of visibility technology (i.e., camera-based system or traditional outside mirrors).

Information for both parts of the data collection will be obtained in an incremental fashion to determine which individuals have the necessary characteristics for study participation. All interested candidates will complete Question Set 1, Driving Research Study Interest Response Form. A subset of individuals meeting the criteria for Question Set 1 will be asked to complete Question Set 2, Candidate Screening Questions. From the individuals found to meet the criteria for both Questions Sets 1 and 2, a subset will be chosen with the goal of achieving a balance of age and sex to be scheduled for study participation. Both data collection parts together will involve approximately 750 respondents for Question Set 1 and 375 for Question Set 2. Question Sets 3, 4, and 5 will each have 200 respondents of which 150 will be assigned to the light vehicle category and 50 to the heavy vehicle category. A summary of the estimated numbers of individuals that will complete the noted question sets across both the first and second data collection parts is provided in the following table.

Estimated Numbers of Respondents

Question Set No.	NHTSA Form No.	Questions	Participants (i.e., Respondents)
1	1553	Interest Response Form	750
2	1554	Candidate Screening Questions	375
3	1556	Post-drive Questionnaire: Drive with Camera-Monitoring System	200
4	1557	Post-drive Questionnaire: Drive with Traditional Mirrors	200
5	1558	Post-Drive Questionnaire Final Opinions	200

Estimated Total Annual Burden Hours: For both parts of the data collection, completion of Question Set 1, Driving Research Study Interest Response Form, is estimated to take approximately 5 minutes and completion is estimated to take approximately 7 minutes for

Question Set 2, Candidate Screening Questions. Completion of Question Sets 3 and 4, Post-Drive Questionnaire: Drive with Camera Monitoring System and Post-Drive Questionnaire: Drive with Traditional Mirrors for light or heavy vehicles, is estimated to take 10 minutes for each survey for a combined total of 20 minutes, and 5 minutes is estimated for completion of the final opinions questions for both parts of data collection.

The estimated annual time and opportunity cost burdens across both the first and second data collection parts are summarized in the table below. The number of respondents and time to complete each question set are estimated as shown in the table. The time per question set is calculated by multiplying the number of respondents by the time per respondent and then converting from minutes to hours. The hour value for each question set is multiplied by the average hour earning estimate from the Bureau of Labor Statistics¹ to obtain an estimated burden cost per question set.

Estimated Hour Burden and Opportunity Cost

Question Set No.	NHTSA Form No.	Question Set Titles	Participants (i.e., Respondents)	Time per Response (Minutes)	Total Time (Minutes)	Total Burden Time (Hours)	Total Opportunity Cost	Opportunity Cost Per Participant
1	1553	Interest Response Form	750	5	3,750	63	\$1,784.16	\$2.38
2	1554	Candidate Screening Questions	375	7	2,625	44	\$1,246.08	\$3.32
3	1556	Post-Drive Questionnaire: Drive with Camera Monitoring System	200	10	2,000	33	\$934.56	\$4.67
4	1557	Post-Drive Questionnaire: Drive with Traditional Mirrors	200	10	2,000	33	\$934.56	\$4.67
5	1558	Post-Drive Questionnaire Final Opinions	200	5	1,000	17	\$481.44	\$2.41

¹ *Cost per hour based on Bureau of Labor Statistics Dec. 2019 Average Hourly Earnings data for “Total Private,” \$28.32 (Accessed Jan. 28, 2020 at <https://www.bls.gov/news.release/empsit.t19.htm>)

		TOTAL Estimated Burden:			11,375 minutes	190 hours	\$5,380.80 ≈ \$5,381	\$17.45
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Estimated Total Annual Burden Cost: The only cost burdens respondents will incur are costs related to travel to and from the study location for those that participate in the research study. The costs are minimal and are expected to be offset by the monetary compensation that will be provided to all research participants.

60-Day Notices: On August 28, 2019, NHTSA published a 60-day notice requesting public comment on the proposed collection of information.² We received comments from 23 entities, including 8 organizations and 15 individuals. Organizations submitting comments included American Bus Association (ABA), Automotive Safety Council, Commercial Vehicle Safety Alliance (CVSA), Lotus Cars Ltd., Greyhound Lines, Inc., Stoneridge Inc., Volvo Group, and ZF North America, Inc. Of the 23 commenters, 17 were supportive of the research. No comments addressed the specific questions to be asked of participants. On May 24, 2021, NHTSA published a second 60-day.³ A summary of the comments received on the first 60-day notice and NHTSA's responses to those comments was provided in the second 60-day notice NHTSA published on May 24, 2021. NHTSA received comments from 1,891 entities, including 2 organizations on the second 60-day notice. 1887 individuals, and input from social media-based Tesla owners enthusiast community group. Organizations submitting comments included the Automotive Safety Council and Alliance for Automotive Innovation. There were 35 duplicate entries.

Comments from the Automotive Safety Council (ASC) did not address the topic of PRA clearance, but did include some recommendations related to the proposed research. The comments included acknowledgement of NHTSA's evaluation of the previous comments made

² 84 FR 45209 (August 28, 2019).

³ 86 FR 27952 (May 24, 2021).

by ASC to the original 60-Day Notice, NHTSA- 2019-0082-0001, and expressed support for conducting additional research subsequent to the proposed work that would address previous ASC suggestions. A new comment from ASC requested that study participants be provided an opportunity to familiarize themselves with conventional mirror technology in the test track environment in the same vehicle type as the test vehicle. This may help to reduce variability from “normal” mirror usage and driving behaviors due to the unfamiliar test environment and vehicle type and help isolate the participant response to just the camera technology in the test of the camera equipped system vehicle. ASC also commented that the research should ensure sufficient time for the drivers to get acquainted with the system. NHTSA notes that familiarization time with the new technology is part of the research design.

Two comments from the Alliance of Automotive Innovators did not address the topic of PRA clearance, but offered support for the Agency’s research. The comments noted that some of the organization’s members “currently have CMS already deployed in other markets that comply with established international standards, namely ECE R46 and ISO 16505.” Auto Innovators’ comments expressed strong supports for harmonization with existing international standards and “that NHTSA prioritize its CMS research and rulemaking processes... .”

Of the individuals who submitted comments, 30 indicated support for PRA clearance being given for this work. Another 81 commenters voiced support for the research. The remaining commenters’ input contained opinions regarding whether CMS should be permitted under FMVSS No. 111 and did not address the specific points on which comments were actually requested.

In summary, the proposed research is intended to gather information to address the question of whether camera-based rear visibility system use is as safe as that of traditional mirrors through examination of drivers’ eye glance behavior and driving performance. NHTSA appreciates the feedback and many relevant suggestions offered regarding additional

experimental conditions to consider. NHTSA will consider the provided suggestions as input for follow-on research programs.

PUBLIC COMMENTS INVITED:

You are asked to comment on any aspect of this information collection, including (a) whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility; (b) the accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used; (c) ways for the department to enhance the quality, utility and clarity of the information to be collected; and (d) ways to minimize the burden of the collection of information on respondents, including the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses without reducing the quality of the collected information.

Authority: The Paperwork Reduction Act of 1995; 44 U.S.C. chapter 35, as amended; 49 CFR 1.49; and DOT Order 1351.29.

Issued in Washington, D.C.

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